

**A SUGGESTED PROGRAM FOR TEACHING ENGLISH
NUMBERS VIA-DRAWING AND ITS EFFECTS ON ENHANCING
PROBLEM SOLVING AND NON-VERBAL COMMUNICATION
SKILLS OF AUTISTIC CHILDREN**

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Abstract:

The present study investigated the effects of a suggested program in teaching English Numbers on developing autistic children's problem solving and nonverbal communication skills. A number of ten autistic children from Beni Suef formed two groups (experimental and control groups). The experimental group received an intensive program to learn English numbers via drawing and re-ordering of given shapes. All subjects of the groups were exposed to pre/post tests and scales in both problem solving and nonverbal communication skills. Analysis of obtained data using Manne-Whitney & Wilcoxon non-parametric tests revealed that the suggested program did help the subjects of the experimental group to score, achieve and improve better in both problem solving and non-verbal communication skills. Finally, the present study has pointed out many important recommendations and suggestions for further research that can be of real help to many stakeholders in the area of special education sector generally and to teachers and parents of autistic children in particular.

Keywords: Autistic children-problem-solving-non-verbal Communication.

A SUGGESTED PROGRAM FOR TEACHING ENGLISH NUMBERS VIA-DRAWING AND ITS EFFECTS ON ENHANCING PROBLEM SOLVING AND NON-VERBAL COMMUNICATION SKILLS OF AUTISTIC CHILDREN

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Introduction:

Education has become a human right. In a sense that all students have the same chance to get education whoever they are: regular children or children with special needs. Teaching children with special needs generally and autistic children in particular has become an increasing demand and an instant concern in Egypt in the last decade. This may be a result of the strong worldwide increasing belief in the important role of advantaging and empowering these autistic children by exploring their talents to make the best use of their hidden energies and abilities. Consequently, Egyptian experts of special education have started to positively consider some retardation as disabilities that can be changed into productive abilities. Al-Rawy and Haamad, (1999, 5-12) stated that there is an increasing verbal concern of learners with special needs and a continuous appeal for paving the avenue for equipping them with educational services that match the kind of disorder. But, in practice, autistic children didn't receive enough services that meet their actual needs. This can be attributed to several reasons such as the lack of studies on autistic children's real problems, and the nature of their abnormal behavioral manifestations for many researchers...etc. The researcher believes that serious interest in such children with special needs can, definitely, contribute to and may result in the development of the entire society.

Autism is a complex development disability that appears during the first years of life, and affects a person's ability to communicate and interact with others (Autism Society of America, 2012). A triad of impairments is manifested in autistic disorder: a communication problem that demonstrates significant language impairment; a reciprocal interpersonal relation in social interaction, and in repetitive or mannerist behaviors (Cumming, 2007; Frotin, 2008). In addition to the three main impairments, (Honey, 2007) asserted that the nature of autism embodies a continuum of autistic characteristics. It is found that autistic children have different and unique autistic spectrum disorders within themselves (Jawor, 2006). Autistic children need special kinds of educational and instructive programs developed on both scientific bases and educational criteria. Such programs should take into consideration their characteristics and needs to

help them overcome psychological and educational problems that affect their personal and social adjustment (Kuss, 2007).

Seeking for suitable methodologies for teaching the autistic child, not only it can help in observing the influence of the behavioral disorders on his/her life, but also it may result in discovering new trends and appropriate remedial programs that help stakeholder's better deal with them. Therefore, an autistic child can be changed to be an effective and positive individual in his/her society. One of the most important principles which successfully contributes to the remedy of autistic child is to maintain a friendly relation with him/her and smoothly break the blocks of isolation that s/he builds around himself/ herself; in other words s/he should communicate with others.

The core systems of autism include social impairment, communication impairment, and restricted repertoires of behaviors and interests (American Psychiatric Association, 2000). Students with autism may be unable to communicate their needs appropriately, lack developmentally appropriate play with toys and peers (Lopez,2008) , have difficulty interpreting nonverbal signals from others (Ozonoff&Miller,1996),and may engage in disruptive behavior (Parsons, 2007). Without appropriate intervention, deficits in the area of appropriate classroom behavior, basic functional communication skills, and in navigating common social situations can limit a student's educational progress. Accordingly, social communication, academic skills are deemed to be essential targets for instruction with these students (National Research Council, 2001).

Significance of the Study:

The significance of the present study lies in re-directing the attention of all stakeholders to the following facts:

- 1- Autistic children are learnable human beings who deserve more care, efforts, and instructional training programs.
- 2- Autistic children have many talents such as drawing and coloring. Such abilities can be a great step for teachers and parents to help them learn better.
- 3- Each autistic child is a case by himself / herself.
- 4- The present study will provide parents and teachers with a rich theoretical background and a program that may indirectly help them in overcoming their autistic children's problem of "loneliness" and "problem solving", and nonverbal communication.
- 5- The utilized tools of the present study whether developed or translated by the researcher herself can be a good resource for stakeholders to identify "autism" in childhood stage and to enhance the level of problem -solving of autistic children.

6-Finally, the present study is an empirical study that can be conducted in Egypt and other Arabian countries to deal with teaching autistic children the English numbers via drawing.

Statement of the problem:

The problem of the present study can be stated in the following major question:

How effective can a program in teaching English numbers via-drawing be on enhancing problem solving and non-verbal communication skills of Autistic Children?

This major question can be branched into the following sub-questions:

- a) How effective can a program in teaching English numbers via-drawing be on enhancing problem solving of Autistic Children?
- b) How effective can a program in teaching English numbers via-drawing be on enhancing non-verbal communication skills of Autistic Children?

Procedures of the study:

In order to implement the present study, the researcher went through the following procedures:

- 1) With the help of the class teachers, the researcher has paid several field visits to Fikrya School to be familiar with the subjects of the study.
- 2) Before the implementation of the program, the researcher conducted a pilot study to make sure that subjects will be able to comprehend and understand the procedures she will follow and the tools she will use.
- 3) With the help of autistic children teachers, the researcher observed and identified the most proper ways to communicate with these autistic children during this observation process. Also, the researcher found it better to collect data with the help of the specialized teachers.
- 4) Reviewing the reports of the autistic children to determine the degree and level of the autism they have.
- 5) Identified the suitable age of the sample (8-12).The researcher utilized the two equivalent groups (experimental & control) design.
- 6) The researcher chose three volunteer teachers who were partially paid by the researcher. They were all well-trained on using sign language. The three teachers were the regular class teachers of the target subjects of the study. They all received training courses in this field. The researcher met with these teachers and explained them the aims, contents, and activities of the program, the researcher asked them to help her in implementing the program. For the researcher, these meetings aimed to identify both the emotional aspects: (the obvious ones like anger, sadness, fear, confusion situations, and hesitation) and the behavioral aspects: (the signs s/he uses to convey her messages).

- 7) The researcher collected the necessary information about the subjects of the study and got their parents' verbal approvals via phone.
- 8) Pre-testing both of the experimental and control groups in problem solving and nonverbal communication skills.
- 9) Then checking the equivalence of both of experimental and control groups concerning problem solving test by using Mann-Whitney test which proves that there are no significant differences between the experimental and control groups as shown in table (1):

Table (1)

Significance of differences between the experimental and control group in the pre problem solving test

Dimensions	Group	N	Mean Ranks	Sum of Ranks	U	Z	Sig.
General information	Exp.	5	4.40	22.00	7.00	1.21	0.23
	Cont.	5	6.60	33.00			
Identifying the problem	Exp.	5	4.80	34.00	9.00	0.81	0.42
	Cont.	5	6.20	31.00			
sequencing	Exp.	5	5.00	25.00	10.00	0.57	0.57
	Cont.	5	6.00	30.00			
Negative questions	Exp.	5	5.90	29.50	10.50	0.46	0.65
	Cont.	5	5.10	25.50			
predicting	Exp.	5	6.40	32.00	8.00	1.01	0.32
	Cont.	5	4.60	23.00			
Making inferences	Exp.	5	6.20	31.00	9.00	0.78	0.44
	Cont.	5	4.80	24.00			
Justifying opinions	Exp.	5	5.90	29.50	10.50	0.46	0.65
	Cont.	5	5.10	25.50			
Generalizing skills	Exp.	5	6.20	31.00	9.00	0.78	0.44
	Cont.	5	4.80	24.00			

- 10) Checking the equivalence of both of experimental and control groups concerning non-verbal communication scale by using Mann-Whitney test which proves that there are no significant differences between the experimental and control groups as shown in table (2):

Table (2)

**Significance of differences between the experimental and control group
in the pre non-verbal communication scale**

Dimension	Group	No.	Means of rates	Sum of rates	U value	Z Value	Sig.
Non-lingual Dimension	Exp.	5	4.70	23.50	8.50	0.88	0.38
	Cont.	5	6.30	31.50			
Cognitive Communication	Exp.	5	5.60	28.00	12.00	0.11	0.91
	Cont.	5	5.40	27.00			
Social Dimension	Exp.	5	5.90	29.50	10.50	0.52	0.61
	Cont.	5	5.10	25.50			

- 11) Presenting the program of English numbers to Autistic children.
- 12) Post-testing the subjects of the study in problem solving and nonverbal communication skills.
- 13) Using the appropriate statistical analysis of the collected data.
- 14) Interpreting and discussing the obtained results.
- 15) Coming up with some recommendations and suggestions for further research in the field.

Variables of the study:

- 1- The independent variable is
The training program in English numbers via drawing.
- 2- The dependent variables are:
 - a) Problem solving skills.
 - b) Non-verbal communication skills.

Tools of the Study:

1. A Scale to identify Autistic children (Adopted from Al- Rawi, 2009), and translated by the researcher.
2. A Problem –Solving Test for Autistic Children. (Developed by the researcher).
3. A Scale of “Non-verbal Communication Skills for Autistic Children” (adopted from Al- Rawi, 2009 and translated by the researcher), and translated by the researcher).

Validity & Reliability of the study tools:

The validity of the problem solving test were statistically measured through calculating the internal consistency of the test by measuring the correlation coefficient for every dimension and the total score of the test. The correlation coefficient ranges from 0.72-0.75 which is considered high, and significant at 0.05. The reliability of the test was measured by alpha coefficient that ranges from 0.80 to 0.84 which are high. This is evidence that the problem solving test was valid and reliable. This is represented in the following table (3).

Table (3)
Validity & Reliability of Problem Solving test

Dimensions	Alpha coefficient	Correlation coefficient
General information	0.83	0.77
Identifying the problem	0.80	0.73
Sequencing	0.82	0.72
Negative questions	0.81	0.75
predicting	0.84	0.76
Making inferences	0.81	0.75
Justifying opinions	0.81	0.74
Generalizing skills	0.80	0.74

Concerning non-verbal communication scale, its validity was measured through measuring the correlation coefficient for every dimension and the total score of the scale, and the results were high as the correlation coefficient scores range from 0.68 to 0.70 which is considered high, and significant at 0.05. The reliability was measured by Alpha coefficient, and the scores were range from 0.82 to 0.86. This is represented in the following table (4).

Table (4)
Validity & Reliability of Non-verbal communication scale

Dimension	Alpha Coefficient	Correlation coefficient
Non-lingual Dimension	0.86	0.69
Cognitive Communication	0.83	0.70
Social Dimension	0.82	0.68

Manipulated Materials:

A program in English numbers via drawing. (Developed by the researcher. The present program differs from many regular programs as it targets special "subjects" and it presents new activities; re-ordering, rearranging , coloring ,and drawing. Due to this unique nature of the autistic children, the program has considered the following domains:

* This program aims at improving the skills of learning English numbers. It presents some instructional situations which lead subjects to solve or deal within a verbal or a nonverbal manner sometimes.

* This program helps autistic children to understand the English numbers through rearranging shapes, coloring given shapes, and drawings.

Domains of the program:**a) Cognitive domain:**

By giving the autistic children simple ideas about the English numbers (by sign language or so).

b) Affective domain:

It includes positive attitudes to improve skills of learning English numbers, eliminating fear, shyness, and negative feelings, encouraging the autistic children, and increasing their learning motivation. Beverly(1989) mentions that teachers play a very important role in building children's beliefs and attitudes towards learning process, teachers contribute to the development of their linguistic skills as they should listen carefully and attentively to their children because it is going to increase their personal skills. They also should invite all students to guide their own learning processes.

c) The psychomotor domain (the suggested one):

It includes direct performance to improve autistic children language learning skills of English numbers. This is presented through various techniques in the present program.

d) Philosophy underlies the program (the cognitive theory behind the study):

The program is based on the behavioral theory in cognitive psychology to learn how to modify wrong cognitive behavior through positive support.

e) Designing of the program: To develop the present program in teaching English numbers to the autistic children the researcher followed these steps:

*Reviewing programs in teaching autistic children such as; Barnard (2008), Boucher (2007), Charlop (2006).

*Searching online websites and electronic articles for teaching English numbers to autistic children.

*Reviewing the related studies and literatures on teaching autistic children.

General objectives of the program:

To achieve objectives of this program, the researcher with the help of the three professional teachers utilized their educational experiences and situations in which the autistic child practices the experience freely. The general objectives of this program can be stated as follows:

a) To learn the English numbers.

b) To develop rearranging as learning skills.

c) To help autistic children comprehend English numbers as reflected in their coloring activities.

Other incidental objectives of the program:

This program resulted in improving the autistic children's abilities to learn English numbers through pictured situations and various educational situations, this objective was achieved as a result of:

- * Training autistic children on visual linguistic activities to improve their abilities to learn English numbers.
- * Giving the autistic children the chance to participate in a free and spontaneous way and accept their thoughts and imaginations.
- * Eliminating (removing) fear and shyness of the autistic child and encouraging him\ her to participate effectively.

Design of the experiment:

The present study utilized the two equivalent groups design (experimental and control). All the groups' subjects were exposed to a pre-test in problem solving and non-verbal communication ,The experimental group was taught through the training program in English numbers via "drawing" and Re-ordering of shapes" ,but the control group was taught in the traditional method, and finally to a post testing means of getting data.

Subjects of the study:

A number of ten male and female autistic children at the age' (8-12) were chosen to participate in the present study. Five of them represent the experimental group, and the other five represents the control group. They were all enrolled at Fikrya School in Beni Suef governorate where the researcher lives.

Instructors:

In addition to the researcher, there were three specialized and well trained teachers of the regular classrooms. They were also willingly chosen to participate in the present study.

Hypotheses of the study:

The following hypotheses are tested:

- 1-There are statistically significant differences between means of scores obtained by the experimental group and the control group on the post testing (favoring the experimental group) in "Problem Solving "(as measured by the "Problem Solving Test for Autistic Children".
- 2- There are statistically significant differences between means of scores obtained by the experimental group on the pre- post testing (favoring the post administration in " problem solving" (as measured by the " problem solving Test for Autistic Children".

- 3- There are statistically significant differences between means of scores obtained by the experimental group and control groups on the post testing (favoring the experimental group) in "Non-verbal Communication skills" (as measured by the Non-verbal Communication Scale for Autistic Children".
- 4- There are statistically significant differences between means of scores obtained by the experimental group on the pre-post testing (favoring the post administration) in "Non-verbal Communication" (as measured by the "Non- verbal Communication Scale for Autistic Children".

Limitations of the study:

1. The training program in English numbers was limited to the use of "drawing" and "re-ordering of shapes" strategies only.
2. The present study was limited to the dependant variables of "problem solving" and "Non-verbal Communication skills" of autistic children.
3. Subjects were limited to autistic children at the age (8-12) enrolled in Fikrya school in Beni Suef governorate.
4. The training program lasted for almost the entire first term of the academic year 2013/2014.

Theoretical background

The Nature of Students with autism

Autism Spectrum Disorder is a neurodevelopmental disorder with a range of associated disabilities. Within the spectrum, both Asperger's Syndrome and High Functioning Autism are classified as having a larger skill set and those affected are more often included in a general education setting. The diagnosis of autism spectrum disorder requires impairment in reciprocal social communication, social interaction, and restricted, repetitive patterns of behavior interest or activities. Symptoms are present from early childhood and limit or impair everyday functioning (Autism Society of America, 2013, P.53). Autism is a diverse and complex developmental disorder which has been found throughout the world in all racial, ethnic and social groups (Perko & McLaughlin, 2002).

Autistic individuals tend to be highly individualistic in how their symptoms present. A common characteristic is a difficulty with language. Some autistic children may never learn to speak while others may use speech inappropriately and not understand the social conventions of language or the more subtle metaphors and figurative usages. Another characteristic is that most autistic individuals find it hard to deal with change in their environment and need to be prepared for a change in routine. They often comfort themselves by following their own routine obsessively.

Ghufron (1999) said that teaching autistic learners needs more focus on improving communication arranged in directions that are given step-by-step, verbally, visually, and by providing physical supports or prompts. He explained that autistic students need some special learning, such

a. In improving communication, social, academic, behavioral, and daily living skills, which need to be more focused.

b. Classroom environment structured should make the program consistent and predictable.

c. Interaction with nondisabled peers is important for these students, such as providing models of appropriate language, social, and behavioral skills.

d. Consistency and continuity are very important for children with an autistic disorder.

e. Directions should be given step-by-step, verbally, visually, and by providing physical supports or prompts needed by the student.

Autism itself is manifested in students very differently. There is a set of criteria called the DSM-IV that identifies individuals with autism when they demonstrate evidence of the indicators in varying degrees. The wide spectrum of behaviors makes the disability difficult to diagnose. These indicators include the following: “patterned, repetitive, focused behavior resistance to change....language cognitive or other developmental delays...impaired ability to understand cause and effect relationships and draw inferences... literal, concrete thinking...and difficulty with language comprehension” (Labarbera & Soto-Hinman, 2009, pp.1-2; Hare, 2013, pp. 10-12). Students with autism may experience one or many of the above indicators and in varying degrees. Therefore; it is a challenge for teachers to know what instructional strategies work and what ability level the child possesses without thorough observation.

A recent Centers for Disease Control and Prevention report estimates the prevalence of autism spectrum disorders as 1 child per every 150 (Centers for Disease Control and Prevention, 2007). The influx of vast numbers of children with autism in the school systems will pose a number of challenges for teachers. These problems stem from how the core deficits of autism affect a student's ability to access traditional learning environments. These deficits involve a distinct constellation of behavior symptoms· incorporating impairments in three developmental domains :(a) impairment of reciprocal social interactions, (b) impairment in verbal and nonverbal communication, including problems in imaginative activity, and (c) impairment in behavior, including a markedly restricted repertoire of activities and interests. (Gabriels & Hill, 2002, p. 26).

According to Prasetyono, here are some factors of autism and other medical diagnosis (Prasetyono, 2008). The first is disorder of central nerve

formation. The expert found that there is anomaly in the central nerve formation in autistic child's brain. There is decreasing of purkinje cell in their brain. It results less serotonin production and disturbs the process of information connecting inter-brain. They also found that there is anomaly structure in central emotion in autistic child 'brain so that their emotion often gets trouble. Then disorder of metabolism system. There is relation between the disorder of metabolism system and the indication of autism. Secreting injection can help to decrease metabolism disorder. Next is enteritis. The autistic child generally has bad digestion and enteritis. It is presumed that enteritis is distempered by a virus. It may come from measles virus. That's why many parents refuse MMR immunization (Measles, Mumps, Rubella) because it is presumed to become the factor of autism. And the last is genetic factor. The most famous factor of autism is genetic factor. There are several genes included autism .But the indicator of autism can appear if there are many genes combinations.

Because of the degree of heterogeneity among students with autism, teachers cannot rely on one uniform curriculum for all students. Some students need more help with communication whereas others require greater assistance with social development (Kubina & Yurich,2008). Although students with autism have unique sets of strengths and weaknesses, all would benefit from a variety of research-based educational practices. One such practice, precision teaching, offers a method for monitoring student progress across any skill repertoire such as play, academics, or functional communication. Furthermore, precision teaching fosters the development of fluency which aids in the generalization and maintenance of skills. As (Scott, Clark, and Brady, 2000: 312) stated, "Given the acknowledged generalization problems facing students with autism, developing fluent performances should be considered absolutely essential". While sharing some characteristics, individuals with autism differ in important ways, so it is assumed that there is a spectrum of autistic disabilities called "Autism Spectrum Disorders"(ASD); ranging from "low functioning autism" (LFA) to "high functioning autism" (HFA) and "Asperger's Syndrome" (AS). The distinction between LFA and HFA consists mainly of the fluency and flexibility of expressive language skills (Austin , et al , 2008). LFA individuals may be mute or may acquire only minimum speech characterized by echolalia (the immediate repetition of what is said by another person) without any apparent communication purpose .HFA individuals develop speech, but tend to show idiosyncratic use of words and phrases and have difficulty participating in conversations (Boucher, 2001).

Teaching English to autistic children:

English teaching for autistic children is not easy, because the autistic children have obstructions in their development such as the weakness in their cognitive and emotional function, the obstacles in their communication and social interaction. Because of those differences, the English teaching techniques for autistic children are different from that of others. (Ball-Erickson, 2012). Teaching English may be challenging and difficult, so that it needs some suitable techniques to make it interesting. Ameen (2001) states that teaching techniques are the ways in which the teaching of certain subject matters is carried out whatever they are. English teaching techniques are particular ways in the process of helping the students in changing knowledge up about English subject as well as English as second or foreign language. Many kinds of techniques are usually used by English teachers in their class such as presentation, repeat and re-phrase modeling, drilling, authentic material, music and jazz chants activities, multimedia, quiz and peer coaching. (Hasanah, et al, 2013). According to (Brown, 2001), teaching techniques are the ways in which the teaching of specific subject matter goes on which are studied in courses on curriculum and instruction in reading, science, social studies, mathematics, English, and the like. It can be noted that English teaching techniques are particular ways in the process of helping the students in changing the knowledge up about English subject as well as English as second language or foreign language.

Indeed, teaching to autistic children is not an easy task and needs more efforts exerted by the teachers aiming at teaching those special cases. In spite of that many studies have proven that teachers succeeded in teaching autistic children different skills in English. Yahia, et al (2013) carried out a study to prove the capability of autistic children to learn English vocabulary. According to this study, the main factor in teaching for autistic children is support. As those children need more efforts and support from the teacher. It can be in the form of modeling, the teacher can model the tasks or intended behaviors to students in order to help them master them, then the teacher asks autistic children to try them themselves.

Pupils now coming into mainstream schools are likely to be diagnosed with high functioning autism or Asperger syndrome. Asperger syndrome, described by Frith (1991) as 'a dash' of autism, is the diagnosis where, alongside other specific criteria, language develops normally, even precociously, in a young child. High-functioning autism is a relative term, given to the minority of those diagnosed as autistic that does not have considerable learning difficulties. It is important to think of autism as a spectrum, but also to remember that wherever someone is placed on the

spectrum, there is always the so-called triad of impairments (Wing, 1996). This is the crux of autism and, as it is evident even in those with a very high level of cognitive ability, therefore requiring acknowledgement on the part of the teacher,

Learning challenges faced by students with autism:

Autism is a neurological disorder and marked by social, communication and language deficits (Tager-Flusberg, 2004). The characteristics of children with autism may differ from one another as autism is a spectrum. Some children with autism exhibit self-stimulatory behaviors, such as staring at rotating objects, as well as repetitive body movements, such as rocking, spinning, and flapping their hands in front of their face (Simpson, 2005). In some cases, children with autism may display self-injurious behaviors (Schreibman & Ingersoll, 2005). Research has identified that some children classified with autism have superior skills in certain areas such as in the areas of memory, mechanical ability, music, or calculation. Despite the impairments, a child with autism has the ability to learn. This can be achieved through a combination of teaching strategies. The most effective teaching strategies should be highly structured to emphasize clarity and order (Arick, et al., 2004). These include teacher directed learning, the use of scaffolding, repetition of tasks and the presentation of information in small chunks to help students grasp newly taught skills (Scheuermann, 2010). In most cases, these children benefit from structured teaching.

Autism can involve severe communication and behavior problems and this can have an impact on the kind of education that is most appropriate for autistic individuals. In fact, autism has been called the ultimate learning disability because of its associated language and social difficulties. Autistic children sometimes exhibit unique learning characteristics such as demotivation, unexpected responses to reinforcement and obsessive attention to irrelevant detail (Perko and McLaughlin, 2002). The majority of autistic children scores within the moderately retarded range on IQ tests and generally have higher non-verbal than verbal IQs. However, these scores have to be interpreted with caution because these children are often hard to test (Schreibmann, 1988). Furthermore a well-known study showed that 9.8% of their autistic sample displayed extraordinary abilities known as "savants" (Rimland in Comer, 1992). This tends to be a pocket of brilliance out of proportion to the individual's general level of functioning and has been documented in all areas including unusual musical, mechanical, artistic or mathematical skills. Often family members are not aware of where or how their autistic children may have picked up this skill.

Many studies have proved that the use of visual cues work more with children with autism as they help them learn and communicate their needs. Students with autism showed greater ability in attending and processing visual stimuli than auditory ones. So, visual-spatial language that is represented by print and visual supports could be beneficial for the teaching and learning of children with autism. In addition to having visual strengths, children with autism have been found to respond to direct instruction and discrete trial teaching format. (Quill, 1995; Iovannon, et al, (2003; Newman, et al, 2007). Pasco (2012) explained that autistic students need some special learning, such as :

- a) In improving communication, social, academic, behavioral and daily living skills which need to be more focused.
- b) Classroom environment structured should make the program consistent and predictable.
- c) Interaction with nondisabled peers is important for these students, such as providing models of appropriate language, social and behavioral skills.
- d) Consistency and continuity are very important for children with an autistic disorder.
- e) Directions should be given step by step, verbally and providing physical supports or prompts needed by the student.

Autistic child is a child who experiences high development interference which influences the way someone communicates and relates to other people (Prihatini, 2009). Autistic children get difficulties in communication because they have disorder in producing language. Meanwhile language is the main medium in communication. Nowadays many autistic children's parents try to improve their speech ability through speaking training. But actually the case is that speaking training is not always appropriate. It means that speaking training only coaches one of communication aspects. By demanding autistic children be able to speak fluently makes them tight and stress obstructs them to think freely (Hitchcock, & Hughes, 1996).

Communication & Autistic children:

Autistic children are inclined stolid because they have communication disorder. It generally can be divided into two parts; verbal and nonverbal communication disorder. Verbal communication disorder is when children can speak up but cannot communicate to other people. For example, they only parrot and speak in wrong situation. On the other hand, nonverbal communication disorder appears from simple thing such as less eyes contact, less concept of body language, moreover cannot speak at all. Communication disorder first can be brought on disorder in producing words. Then auditory disorders in which they cannot hear word even less understand word meaning and associate a situation. Also an environment

does not support children to be motivated and develop their ability (Woodhouse, 2006).

Communication problem belonged to autistic children in learning simple words in repetition or parroting. They always repeat what they hear without understanding its meaning. That's why speech therapy must be a crucial thing in their daily activity in order to be able to communicate and interact among society. Recognizing object, event, and people around their environment is more important than abstract object such as value, self-esteem, and divinity. They will be easier to memorize obvious object because they see it directly (Shattuck, 2010).

Definitions of Technical Terms:

Autism is defined as a linguistic disorder and a deficiency of social relations and language development reflected via a series of insistence on repetitive stereotypical activities and daily routine. Rawi, 2009,64;(Al-Saadi,2001,36; Gillberg, 1990, 111; Simpson &Mayles ,1998,108;Dianne ,1992: 14; Khaleed ,2001,18)

Gillberg(1990,19) ,Ward (1997, 43), Mahmoud(1993,280) and Faraj(2002,150) agreed that the term autism comes back to the origin of a Greek word that means "aut-ism" which means self and the word "ism"means incomprehensibility. So the whole term can be translated into "the incomprehensibility of self" then it becomes the form of autism. The word autism was chosen as a term for this illness. It is unique in its meaning and isn't used much in Arabic.

The researcher defines Autism as:

"A developmental disability significantly affecting verbal and nonverbal communication and social interaction that is generally evident before age three and that adversely affects a child's educational performance. Major characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

Problem Solving:

In the present study, the researcher defines it as:

"The ability of the autistic child to deal with a given thinking situation that challenges him/her to use given shapes to form specific number(s)through imitation and colouring. Thus, it is the process of identifying a discrepancy between an actual and desired state of affairs and then taking action to resolve the deficiency. The entire problem-solving process is dependent upon the right information being available at the right time."

Non-verbal Communication skills:

In the present study, the researcher defines it as the ability of the autistic child to understand, use, express and reflect all his/ her own emotions through physical expressions to manage social situations s/he encounters.

Results & Discussion:

Hypothesis (1) predicted that there were statistically significant differences between means of scores obtained by subjects of the study (experimental and control groups) on the post testing (favoring the experimental group) in "Problem Solving "(as measured by the "Problem Solving Test for Autistic Children". Results of the present study came to support this hypothesis as the analysis of data using "Mann-Whitney test" showed that "U" & "Z" values were significant at 0.01 levels. Thus, the first hypothesis was confirmed. Table (5) below indicates that the program in teaching English numbers via drawing and re-ordering of given shapes helped the subjects of the autistic children (the experimental group) to improve their problem solving skills as they were able to score higher in their post-testing of problem solving . Also this was indicated through measuring the means of scores for both of the experimental and control group as illustrated in table 6 & diagram No.1 These results coincided with many other researchers such as Woodhouse (2006, 6), and Rutherford (2007,66).

Table (5)

Significance of differences between the experimental and control group in the post problem solving test

Dimension	Group	NO.	Means rank	Sum of ranks	"U"	"Z"	Sig.
General information	Exp.	5	8	40	0.00	2.635	0.008
	Cont.	5	3	15			
Identifying the problem	Exp.	5	8	40	0.00	2.643	0.008
	Cont.	5	3	15			
sequencing	Exp.	5	8	40	0.00	2.635	0.008
	Cont.	5	3	15			
Negative questions	Exp.	5	8	40	0.00	2.635	0.008
	Cont.	5	3	15			
predicting	Exp.	5	8	40	0.00	2.643	0.008
	Cont.	5	3	15			
Making inferences	Exp.	5	8	40	0.00	2.677	0.007
	Cont.	5	3	15			
Justifying opinions	Exp.	5	8	40	0.00	2.635	0.008
	Cont.	5	3	15			
Generalizing skills	Exp.	5	8	40	0.00	2.627	0.009
	Cont.	5	3	15			

Table (6)
Means of scores of the experimental & control groups in problem solving test

Dimension	Means Experimental		Means Control	
	pre	post	pre	post
General information	0.05	3.11	0.07	0.06
Identifying the problem	0.01	1.23	0.03	0.05
Sequencing	0.13	3.03	0.10	0.13
Negative questions	0.08	2.33	0.09	0.19
Predicting	0.12	3.12	0.10	0.18
Making inferences	0.02	1.09	0.01	0.32
Justifying opinions	0.10	2.10	0.11	0.11
Generalizing skills	0.01	1.45	0.03	0.03

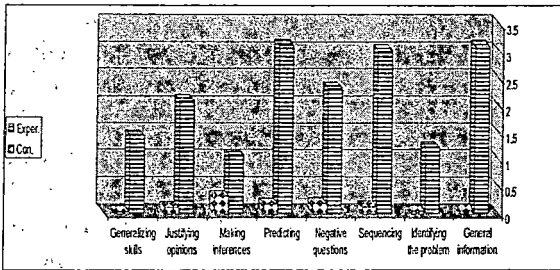


Diagram No.1

**Means of experimental and control in the post performance test
on problem solving**

Hypothesis (2): predicted that there were statistically significant differences between means of scores obtained by the experimental group on the pre/post testing (favoring the post administration) in "Problem Solving "(as measured by the "Problem Solving Test for Autistic Children". Results of the present study came to support this hypothesis as the analysis of data using "Wilcoxon test" showed that "Z" values were significant at 0.05 levels. Thus, the second hypothesis was confirmed. Table (7) below indicates that the program in teaching English numbers via drawing and re-ordering of given shapes helped the subjects of the autistic children (the experimental group) to improve their problem solving skills as they were able to score higher in their post-testing of problem solving. This was also indicated by calculating the means of scores of the experimental group in pre and post administration of the test. (see table 6 & diagram No. 2).

Table (7)
Significance of differences between means of ranks of the scores of experimental group in the problem solving test before and after administering the program

Dimensions	Ranks	N	Means of ranks	Sum of ranks	"Z"	Sig.
General information	Positive	5.00	3.00	15.00	2.06	0.039
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
Identifying the problem	Positive	5.00	3.00	15.00	2.06	0.039
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
sequencing	Positive	5.00	3.00	15.00	2.32	0.042
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
Negative questions	Positive	5.00	3.00	15.00	2.32	0.042
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
predicting	Positive	5.00	3.00	15.00	2.32	0.042
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
Making inferences	Positive	5.00	3.00	15.00	2.32	0.042
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
Justifying opinions	Positive	5.00	3.00	15.00	2.32	0.042
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		
Generalizing skills	Positive	5.00	3.00	15.00	2.41	0.041
	Negative	0.00	0.00	0.00		
	Ties	0.00	0.00	0.00		

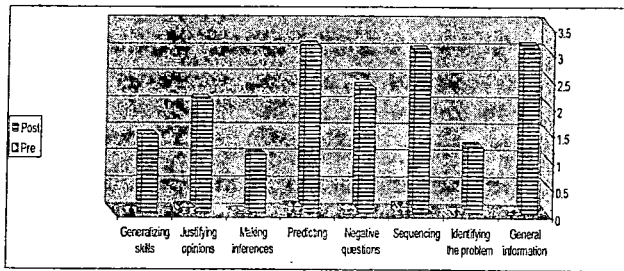


Diagram No. 2

Means of scores of experimental group in pre & post administration in problem solving test

Hypothesis (3) predicted that there were statistically significant differences between means of scores obtained by subjects of the study (experimental and control groups) on the post measurements (favoring the experimental group) in "Non-verbal Communication" (as measured by the Non-verbal

Communication Scale for Autistic Children. Results of the present study came to support this hypothesis as the analysis of data using Mann-Whitney test" showed that "U" & "Z" values were significant at 0.01 level. Thus, the third hypothesis was confirmed. Table (8) below indicates that the developed program in teaching English numbers via drawing and re-ordering of given shapes helped the subjects of autistic children to improve their non-verbal communication skills. Their post means of scores was higher if compared to the post measurement means of scores for the control group. (See table 9, diagram No.3). These results coincided with the view points of some other researchers such as Lantz (2005, 31-33) and Rawi (2009, 143-145).

Table (8)

Significance of differences between the experimental and control group in the post non-verbal communication scale.

Dimension	Group	No.	Means of ranks	Sum of ranks	" U"	" Z"	Sig.
Non-lingual Dimension	Exp.	5	8	40	0.00	2.70	0.007
	Cont.	5	3	15			
Cognitive Communication	Exp.	5	8	40	0.00	2.63	0.009
	Cont.	5	3	15			
Social Dimension	Exp.	5	8	40	0.00	2.66	0.008
	Cont.	5	3	15			

Table (9)

Means of scores of experimental & control groups in non-verbal communication scale

Dimension	Exp.		Cont.	
	Pre	post	pre	post
Non-lingual dimension	5.66	30.43	6.32	6.45
Cognitive communication	4.54	25.75	5.11	5.21
Social dimension	2.65	14.21	2.44	2.98

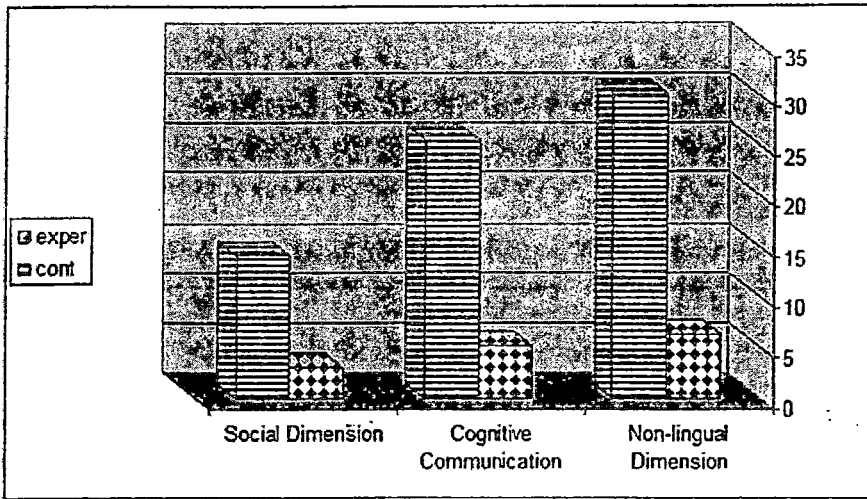


Diagram No 3

Means of scores of experimental & control groups in post administration non-verbal communication scale

Hypothesis (4) predicted that there were statistically significant differences between means of scores obtained by the experimental group on the pre/post testing (favoring the post administration) in "non-verbal communication scale" (as measured by the "non-verbal communication scale for Autistic Children". Results of the present study came to support this hypothesis as the analysis of data using "Wilcoxon test" showed that "Z" values were significant at 0.05 levels. Thus, the fourth hypothesis was confirmed. Table (10) below indicates that the program in teaching English numbers via drawing and re-ordering of given shapes helped the subjects of the autistic children (the experimental group) to improve their non-verbal communication skills as they were able to score higher in their post-testing of non-communication scale. This was confirmed by measuring the means of scores of the experimental and control groups in non-verbal communication scale.(table "9" & diagram No.4)

Table (10)
Significance of differences between means of ranks of the scores of experimental group in the non-verbal communication scale before and after administering the program

Dimensions	Ranks	No	Means of ranks	Sum of ranks	Z	Sig.
Non-lingual Dimension	Positive	5	3.00	15	2.32	0.042
	Negative	0	0	0.00		
	Ties	0	0	0.00		
Cognitive Communication	Positive	5	3	15.00	2.32	0.042
	Negative	0	0	0.00		
	Ties	0	0	0.00		
Social Dimension	Positive	5	3	15.00	2.07	0.038
	Negative	0	0	0.00		
	Ties	0	0			

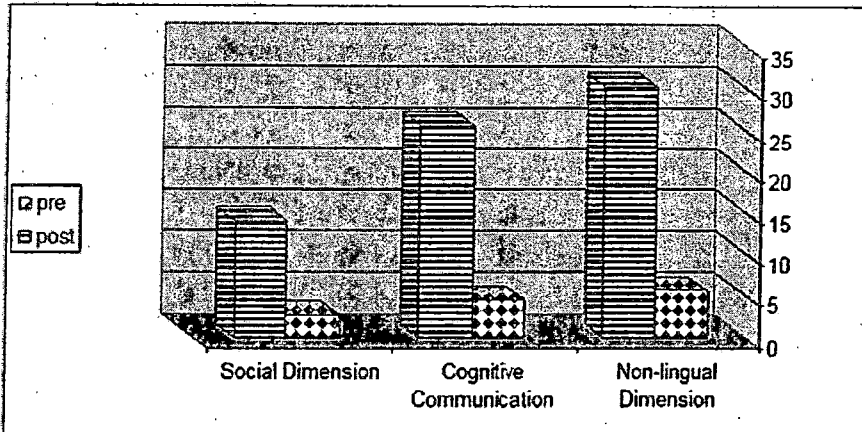


Diagram No.4

Means of scores of experimental group in pre/post administration of non-verbal communication scale.

Thus, based on the obtained data revealed in the previous tables, the suggested program in teaching English numbers to autistic children via drawing and re-ordering of shapes was found to be effective in enhancing their problem solving and non-verbal communication skills.

Discussion & Conclusion:

Numerous studies tackled autism as it's one of the problems that many people all over the world suffer from. People with Autism are increasingly placed in many countries. Students with autism are often oppressed based on the label they are given, and may not consistently be considered "able" to be critical, conscious members of the classroom. They are also often assumed to have limited abilities past the skill set their teachers are providing them. (Chiang & Lin, 2007; Biklen, et al 2006; Randi, et al, 2010). The influx of vast numbers of children with autism in the school systems will pose a number of challenges for teachers. These problems stem from how the core deficits of autism affect a student's ability to access traditional learning environments. These deficits involve a distinct constellation of behavior symptoms, incorporating impairments in three developmental domains: (a) impairment of reciprocal social interactions, (b) impairment in verbal and nonverbal communication, including problems in imaginative activity, and (c) impairment in behavior, including a markedly restricted repertoire of activities and interests. (Gabriels & Hill, 2002, p. 26).

Some of studies dealt with teaching literacy to students with autism. Past research studies have "indicated that individuals with Asperger syndrome often have above-average intelligence but have difficulty with reading comprehension, however, there is a lack of research in exploring literacy instruction for students with Asperger Syndrome" (as cited in Chiang & Lin, 2007, p. 265). (Carberry,2014; Flores & Ganz, 2009; Dauphin,2004; Burkins & Croft, 2010)

A large numbers of studies concluded that various teaching and learning strategies should be examined and teachers need to be able to determine, based on the strengths and needs of their student(s), which approaches will be most beneficial.(Lanning,2009; Klein & O'Connor,2004;Hart & Whalon,2011;Asberg & Sandberg , 2010; Simpson, et al . 2007).

Visualization is one of the main strategies recommended for students with autism in many studies .This type of strategy support allows the teacher to determine the number of visuals needed for reading and also allows room for differentiation between students or reading groups. Teachers can expand on the strategy by modeling and connecting to student interests, ultimately, together they are working towards independently using the strategy. (Gately , 2008; Kluth&Darmody, 2003; Carter & Kennedy, 2006). Some studies have proved that students with autism can acquire skills like critical thinking , reading comprehension through training (Harper & Maheady , 2007; White,2005; Heward,2003; Kubina ,

2005; Gabriels & Hill , 2002 ; Cauley , et al , 2003 ; Cohen , 2005 ; Kubina & Wolfe , 2005). In conclusion, autism remains a challenging condition for children and their families, but the outlook today is much better than it was a generation ago. At that time, most people with autism were placed in institutions. Today, with the right therapy, many of the symptoms of autism can be improved, though most people will have some symptoms throughout their lives. Most people with autism are able to live with their families or in the community. The outlook depends on the severity of the autism and the level of therapy ,and the learning programs the person receives.

Recommendations:

Based on the obtained results, it is recommended that parents, researchers, teachers and other stakeholders of autistic children should:

1. Look at each autistic child as a case by him /herself especially in teaching and learning situations.
2. Give more patience to the “pre-teaching stage” to maintain deep understanding and good relationships with each individual child and with them all as a one group.
3. Provide needed assistance and information for stakeholders in faculties of education to develop specialized programs for preparing teachers who can merely and mainly work with autistic children.

Suggestions for further research:

1. Investigating the effectiveness of using a musical- based program via group work techniques in teaching English numbers to autistic children and on their social interactive skills.
2. Investigating the effects of using an instructional computer –based program in English numbers with autistic children on their acquisition of these numbers.
3. Investigating the effectiveness of using a program in English numbers via drawing on enhancing autistic children's motor skills.
4. Investigating the effects using an instructional video–based program in English numbers with autistic children on the acquisition of these letters and on enhancing their nonverbal communication skills.

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الملخص باللغة العربية

برنامج مقترح في تعليم الأرقام باللغة الإنجليزية قائم على الرسم وأثره في إثراء أسلوب حل المشكلات ومهارات التفاعل غير اللفظي لدى الأطفال التوحيديين
د. هبة مصطفى محمد

مدرس المناهج وطرق تدريس اللغة الانجليزية
كلية التربية- جامعة بني سويف

ملخص:

هدفت الدراسة الحالية الى محاولة إستقصاء أثر إستخدام برنامج مقترح في الأرقام باللغة الإنجليزية قائم على الرسم في إثراء أسلوب حل المشكلات ومهارات التفاعل غير اللفظي لدى الأطفال التوحيديين. تكونت عينة الدراسة من عشرة أطفال توحيديين من محافظة بني سويف: خمسة أطفال (مجموعة تجريبية) وخمسة أطفال في المجموعة الضابطة. واستخدمت الباحثة التصميم التجريبي للمجموعتين المتكافئتين (تجريبية و ضابطة) حيث خضعت المجموعة التجريبية لبرنامج تعليمي مكثف في تعلم الأرقام باللغة الإنجليزية معتمدين في ذلك على ما لديهم من قدرات خاصة بالرسم وإعادة ترتيب الأشكال أما المجموعة الضابطة فتم التدريس لهم بالطريقة التقليدية. وقد تلقى جميع أفراد العينة اختبارات ومقاييس قبلية وبعدية بهدف التعرف على مدى تقدمهم فيما يتعلق بأسلوب حل المشكلات ومهارات التفاعل غير اللفظي. استخدمت الباحثة اختبار مان ويتني وويلكوكسون لتحليل البيانات والذي أظهرت نتائجها فعالية البرنامج المقترح في تحسين أسلوب حل المشكلات ومهارات التفاعل غير اللفظي لديهم. وأخيرا توصلت الدراسة الحالية الى مجموعة من التوصيات الهامة وبعض المقترحات للبحوث المستقبلية التي تفيد المعنيين في مجال التربية الخاصة بصفة عامة وأولياء أمور ومعلمين الأطفال التوحيديين بصفة خاصة.
الكلمات المفتاحية: الاطفال التوحيديون- حل المشكلات- التواصل غير اللفظي.